

FORM 2F NPDES	EPA	United States Environmental Protection Agency Application for Permit To Discharge Stormwater Discharges Associated with Industrial Activity					
Paperwork Reduction Act Notice Public reporting burden for this application is estimated to average 28.6 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of this collection of information, or suggestions for improving this form, including suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, PM 223, U.S. Environmental Protection Agency, 401 M St., SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503							
I. OUTFALL LOCATION For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.							
A. OUTFALL NUMBER (list)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (name)
	1. DEG	2. MIN	3. SEC	1. DEG	2. MIN	3. SEC	
003	N41	38	59	W87	30	17	Indiana Harbor Ship Canal
004	N41	38	48	W87	29	51	Indiana Harbor Ship Canal
II. Improvements							
A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.							
1. Identification of Conditions, Agreements, Etc.		2. Affected Outfalls			3. Brief Description of Project		4. Final Compliance Date
		number	source of discharge			a. req.	b. proj.
Spill Prevention, Control and Countermeasure (SPCC) Plan		003	Stormwater		Operating procedures implemented to prevent oil spills. Control measures installed to prevent a spill from entering navigable waters or adjoining shorelines.	Updated and revised plan submitted to IDEM 6/1/2011	
		004	Stormwater		Countermeasures put in place to contain, cleanup and mitigate the effects of an oil spill that impacts navigable waters or adjoining shorelines.		
Facility Response (OPA) Plan		003	Stormwater		Establishes procedures to provide for well coordinated efforts by BP personnel and regulatory agencies in the effective management of a response to an incident. The objective is to eliminate or minimize hazards to life and property and adverse impacts upon the environment.	Revised plan submitted to EPA Region V 12/29/2010.	
		004	Stormwater				
Agreed Order Cause No. H-11187		003	Stormwater		Agreement with the Indiana Department of Environmental Management to address environmental concerns at the BP Whiting Refinery. The Agreed Order defined eight interim measures to be implemented at the J&L Site in which Outfalls 003 and 004 are located.	Effective date December 8, 1995.	
		004	Stormwater				
Stormwater Pollution Prevention Plan		003	Stormwater		The SWPPP identifies potential sources of pollution, describes practices and measures for reducing pollution potential, and assures compliance with the permit.	Submitted in Oct 2008, Updated Dec 2010	
		004	Stormwater				
B. You may attach additional sheets describing any additional water pollution (or other environmental projects which may affect your discharges) you now have under way or which you plan. Indicate whether each program is now under way or planned, and indicate your actual or planned schedules for construction.							
III. Site Drainage Map Attach a site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) depicting the facility including: each of its intake and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within the drainage area of each storm water outfall, each known past or present areas used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied; each of its hazardous waste treatment, storage or disposal units (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground; springs, and other surface water bodies which receive stormwater discharges from the facility. See Attachment 9A							

V. Narrative Description of Pollutant Sources					
A. For each outfall, provide an estimate of the area (include units) of surfaces (including paved areas and building roofs) drained to the outfall, and an estimate of the total surface area drained by the outfall.					
Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)	Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)
003 & 004	CURRENT DISCHARGE J & L Tank Field = 16% imperv Lake George TF = 13% imperv J & L Outside TF = 2% imperv Lake George Outside TF = 15 % imperv For further information, see Attachment 9B	90.9 acre 59.0 acre 230.8 acre 66.6 acre	003 & 004	FUTURE REROUTE South TF = 22% imperv South TF Annex = 27% imperv Stieglitz Park = 19% imperv Marine Dock ≈ 13% imperv Indiana TF = 25% imperv	63.5 acre 27.4 acre 50.7 acre 9.0 acre 43.6 acre
B. Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored or disposed in a manner to allow exposure to storm water; method of treatment, storage, or disposal; past and present materials management practices employed in the last three years, to minimize contact by these materials with storm water runoff; materials loading and access areas; and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied					
See Attachment 10					
C. For each outfall, provide the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of the treatment the storm water receives, including the schedule and type of maintenance for control and treatment measures and the ultimate disposal of any solid or fluid wastes other than by discharge.					
Outfall Number	Treatment			List Codes from Table 2F-1	
003 004	See Attachment 10 See Attachment 10			1-H/1-U/4-A 1-H/1-U/4-A	
V. Nonstormwater Discharges					
A. I certify under penalty of law that the outfall(s) covered by this application have been tested or evaluated for the presence of nonstormwater discharges, and that all nonstormwater discharges from these outfall(s) are identified in either an accompanying Form 2C or Form 2E application for the outfall.					
Name and Official Title <i>type or print</i>	Signature	Date Signed			
	<i>N.O.S.</i>	1/31/12			
B. Provide a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test.					
USEPA sampling and analytical methods and guidance were used to collect and generate valid and representative data. Other than NPDES permit-required monitoring, sampling and analyses were conducted on March 24, 2011. Drainage points were those outfalls regulated under the current NPDES permit and were verified as discharging during sampling.					
VI. Significant Leaks or Spills					
Provide existing information regarding the history of significant leaks or spills of toxic or hazardous pollutant at the facility in the last three years, including the approximate date and location of the spill or leak, and the type and amount of material released.					
Date	Location	Type	Amount		
6/4/2010	3606 tank dike (Stieglitz Park)	Oil spill from sewer backup	36 bbl		
8/3/2010	3808 tank containment (J&L field)	Oil spill from sump overflow	>1,000 gal		
8/5/2010	3606 tank containment (Stieglitz Park)	Oil spill from line leak	>1,000 gal		
2/22/2011	OMD complex pipe alley/rack	Oil spill from line leak	>1,000 gal		

IND000810879

Continued from Page 2

VII. Discharge Information

A, B, C, & D: See instructions before proceeding. Complete one set of tables for each outfall. Annotate the outfall number in the space provided. Tables VII-A, VII-B, and VII-C are included on separate sheets numbered VII-1 and VII-2.

E. Potential discharges not covered by analysis - is any pollutant listed in Table 2F-2, 2F-3, 2F-4 a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

 Yes (list all such pollutants below) No (go to Section IX)

Sulfate	Selenium, total	Anthracene	Dibenzo(a,h)anthracene	Vanadium, total
Cobalt, total	Zinc, total	Benzo(a)anthracene	Fluoranthene	Xylenes
Molybdenum, total	Phenols, total	Benzo(a)pyrene	Fluorene	1,2,4-Trimethylbenzene
Arsenic, total	Benzene	Benzo(b)fluoranthene	Indeno(1,2,3-cd)pyrene	Cyclohexane
Lead, total	Ethylbenzene	Benzo(ghi)perylene	Naphthalene	n-Hexane
Nickel, total	Toluene	Benzo(j)fluoranthene	Phenanthrene	Biphenyl
	Phenol	Chrysene	Pyrene	

VIII. Biological Toxicity Testing Data

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

 Yes (list all such pollutants below) No (go to Section IX)**IX. Contract Analysis Information**

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

 Yes (list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below) No (go to Section X)

A. Name	B. Address	C. Area Code & Phone No.	Pollutants Analyzed
Microbac Laboratories, Inc.	250 West 84th Drive Merrillville, IN 46410	(219) 769-8378	All

X. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name & Official Title (type or print)	B. Area Code & Phone No.
Nick Spencer, Whiting Business Unit Leader	219-473-3179
C. Signature	D. Date Signed

1/31/12

VII. Discharge Information (Continued from page 3 of Form 2F)

Part A. You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Continued from pg. VII-1

List each pollutant shown in Tables 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall Outfall 003

Part D. Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm (in minutes)	3. Total rainfall during storm event (in inches)	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum flow rate during rain event (gallons/minute or specify units)	6. Total flow from rain event (gallons or specify units)	7. Season sample was taken	8. Form of Precipitation (rainfall, snowmelt)
Outfall opened at 9:10AM (CT) on March 21, 2011 and closed at 9:20AM (CT) on March 26, 2011.	N/A	N/A	N/A	N/A	N/A	Spring	rainfall

9. Provide a description of the method of flow measurement or estimate.

The discharge from the outfall is manually controlled based on a visual inspection of the level of stormwater in the ditch once per day. When the level is high, a valve is opened to control the release of the stormwater to the canal. In general, the source of the discharge is precipitation; however, the actual release via the Outfall is not necessarily dictated by individual storm events.

Outfall 004

EPA ID Number (*copy from Item 1 of Form 1*)
IND000810879

Form Approved, OMB No. 2040-0086
Approval expires 5-31-92

VII. Discharge Information (Continued from page 3 of Form 2F)

Part A. You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Maximum Values (include units)		Average Values (include units)		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During 1st 30 Min.	Flow-weighted Composite	Grab Sample Taken During 1st 30 Min.	Flow-weighted Composite		
Oil and Grease	8.0 mg/L		0.78 mg/L		178	
Biological Oxygen Demand (BOD ₅)	<2 mg/L				1	
Chemical Oxygen Demand (COD)	53 mg/L				1	
Total Suspended Solids (TSS)	6 mg/L				1	
Total Nitrogen	<0.5 mg/L				1	
Total Phosphorus	0.24 mg/L				1	
pH	Minimum 7.3	Maximum 9.3			181	

Part B. List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements. (Not reporting Part A list.)

Part C. List each pollutant shown in Tables 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfa Outfall 004

Part D. Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

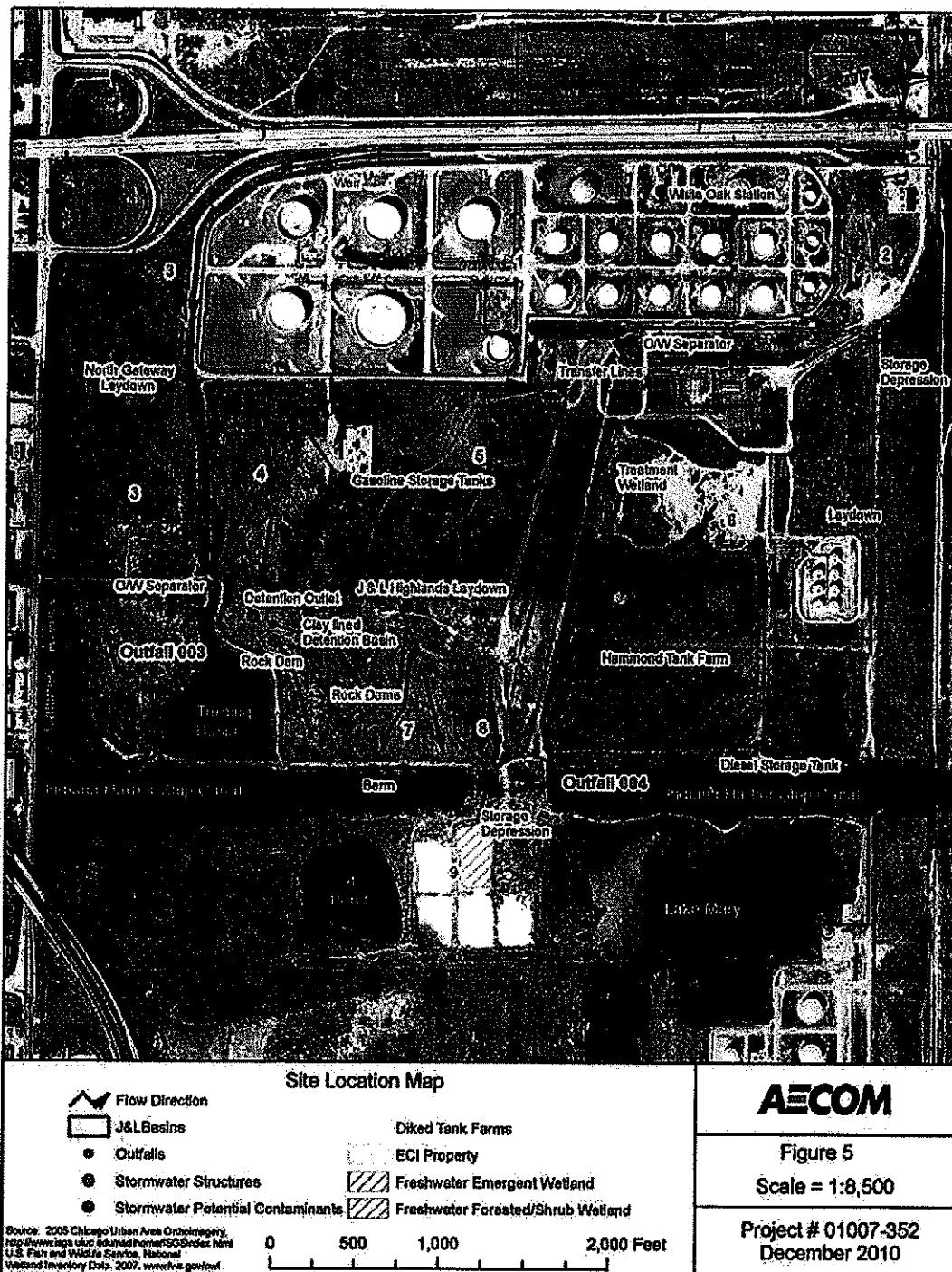
1. Date of Storm Event	2. Duration of Storm (in minutes)	3. Total rainfall during storm event (in inches)	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum flow rate during rain event (gallons/minute or specify units)	6. Total flow from rain event (gallons or specify units)	7. Season sample was taken	8. Form of Precipitation (rainfall, snowmelt)
Outfall opened at 9:30AM (CT) on March 21, 2011 and closed at 1:35PM (CT) on March 25, 2011	N/A	N/A	N/A	N/A	N/A	Spring	rainfall

9. Provide a description of the method of flow measurement or estimate.

The discharge from the outfall is manually controlled based on a visual inspection of the level of stormwater in the ditch once per day. When the level is high, a valve is opened to control the release of the stormwater to the canal. In general, the source of the discharge is precipitation; however, the actual release via the Outfall is not necessarily dictated by individual storm events.

ATTACHMENT 9A

J & L Storm Water Map



Attachment 10. Form 2F – Section IV.B and IV.C

BP Products North America Inc. – Whiting Refinery

Current Discharge to Outfalls 003 and 004 - J&L and Lake George Area

This section describes the area currently contributing to Outfalls 003 and 004, referred to as the J&L and Lake George Area.

The J&L and Lake George Area is located almost entirely in the city of Hammond, with a small portion in the northwest corner located in East Chicago, Indiana. The property is bordered on the north by 129th Street, the Indiana Harbor Ship Canal (south), Calumet Avenue (west), and B&O Railroad right of way (east). See Attachment 9A. Contributing drainage areas include the Lake George Tank Field (59.0 acres), the rest of Lake George outside the tank field (66.6 acres), the J&L Tank Field (90.9 acres), and the rest of J&L outside the tank field (230.8 acres). Whiting Business Unit document E2001 is the Whiting Industrial Storm Water Pollution Prevention Plan (SWPPP) applicable to the J&L Area. The SWPPP identifies potential sources of pollution, describes practices and measures for reducing pollution potential, and assures compliance with the permit.

Land Cover

Approximately 15% of the J&L and Lake George Area consists of impervious refinery structures such as piping and tanks, trailers, and roadways. Natural vegetation occurs in a large section of the J&L and Lake George Area and intermittent landscaped vegetation exists around streets and some buildings. As a result, most of the drainage area routed to Outfalls 003 and 004 is vegetated.

Stormwater Drainage and Outfall Descriptions

Stormwater in the J&L Tank Field can be retained in tank dikes for infiltration and evaporation, or removed via vacuum trucks or manual pumping to the refinery process sewer system if an oil sheen is present. If the stormwater has no visible oil sheen, it can be routed to Outfalls 003 or 004 either manually by vacuum trucks or by a pumping system. Stormwater outside of the tank dikes is either collected in low lying areas for infiltration, or overflows to the west ditch and into the Turning Basin through Outfall 003, or overflows to the East Ditch to the Indiana Harbor Ship Canal through Outfall 004. Outfalls 003 and 004 are fed by vegetated drainage ditches controlled by sluice gates. Additionally, a limited amount of stormwater enters directly into the Indiana Harbor Ship Canal from the south end of the highlands (high ground south of J&L tank fields) during heavy runoff events as overland sheet flow. On the west side of J&L Tank Field, a small amount of runoff enters the Calumet Avenue Drain which drains to the Indiana Harbor Ship Canal.

Stormwater Control Features

Outfalls 003 and 004 currently discharge stormwater runoff from the southwest quadrant of the refinery. The area identified as West Ditch Drainage Area discharges stormwater through Outfall 003 to the Indiana Harbor Ship Canal to the south. The area identified as East Ditch Drainage Basin discharges stormwater through Outfall 004 to the Indiana Harbor Ship Canal. The West Ditch (to Outfall 003) and the East Ditch (to Outfall 004) are oriented from north to south on either side of the J&L Site.

Stormwater from Lake George Tank Field discharges via an underground pipe beneath Cline Avenue to the East Ditch and Outfall 003. Outfalls 003 and 004 are controlled by manually operated sluice gates. These outfalls are inspected daily for any water quality concerns. The sluice gates are opened once per week (usually Monday morning) only after inspection and verification that the discharge is within compliance limits.

Industrial Activities

The northern section of J&L and Lake George Area is a crude oil tank field, whereas the southern section is a multiuse area that is fairly undeveloped and used for material laydown and storage. Lake George Tank Field also contains paved areas for trailers and parking and includes routing of stormwater from the Calumet Avenue warehouse area.

The West Ditch Drainage Basin (Outfall 003) is covered by medium vegetation. This area also contains over 6,400 linear feet of roadway (paved). The J&L Tank Field consists of product storage areas bound on the north by a public roadway, on the east by railroad property, on the south by the Lake George Branch of the Indiana Harbor Ship Canal, and on the west by a public roadway. All tank dikes are typically void of vegetation cover. Vehicle access through and around the areas is via a series of asphalt paved and gravel roads situated on top of the dike walls. The west half of the J&L Tank Field contains 6 large tanks used primarily for the bulk storage of crude oil. Each tank has secondary containment in the form of tank dike. A channel, which originates north of the J&L Tank Field, and runs about 6,180 feet, is approximately 6 feet wide at the bottom and averages approximately 5 feet in depth. There are two flow control gates for regulating stormwater flows. The control measures for this basin include sediment rock check dams, detention basins, diversion channels, control gates, and sediment control structures throughout the area.

The East Ditch Drainage Basin (Outfall 004) is covered by medium vegetation with approximately 1.5 acres covered with heavy vegetation. There are approximately 8,600 linear feet of roads in this drainage basin segment. This area also includes the abandoned Liquid Petroleum Gas (LPG) loading racks and the associated remnant or abandoned rail car access, and laydown areas. A series of drainage channels approximately 3,950 feet in length collect runoff and route it to the East Ditch. Soil erosion controls consist of a detention pond, sediment traps, and slope roughening and diversion dikes.

Stormwater Run-on

Stormwater run-on to the J&L Tank Field occurs from Calumet Avenue and from the B & O Railroad. Calumet Avenue runs the entire western length and its associated drainage ditch connects the Indiana Harbor Ship Canal with Lake George to the north. The J&L Tank Field receives water from Calumet Avenue pavement, 129th Street ditch, Cline Avenue ditches, and properties north of 129th Street including the Lost Marsh Golf Course. This stormwater flows through the Calumet Avenue Ditch on the west side of the property and drains directly to the Indiana Harbor Ship Canal. This run-on will not mix with stormwater from industrial activity because there is no hydraulic connection. At the northeast corner of the property, some stormwater enters the J&L property from the B&O Railroad. However, this run-on is minimal and stays without leaving the property.

Non-Stormwater Discharges

Non-stormwater discharges within the J&L and Lake George Area to Outfalls 003 and 004 may include the following:

- Fire training or system flushing;
- Potable water sources including waterline flushing;
- Uncontaminated ground water;
- Routine exterior building wash down which does not use detergents or other compounds;
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used;
- Air conditioning condensate; and
- Equipment Hydro-testing using fire water.

Specific fire training activities include health, safety, security, and environment (HSSE) training and fire brigade training at the J&L training area, and fire hydrant flushing. HSSE training occurs from June to October, four days per week, with a flow rate of approximately 125 gallons per minute (gpm). Fire brigade training sessions occur once in May, June, and July and use approximately 60,000 gallons per session. This water is retained by natural depressions, infiltrates to ground water, or a small amount drains to a sump pump east of Tank 3915 where it goes to the refinery process sewer.

Additionally, this area is under a forced agreement remediation project with Indiana Department of Environmental Management (IDEM) where multiple well point systems are in operation for ground water remediation. As contaminants are pumped out of the ground there is possibility for some stormwater contamination from condensation or equipment rain wash-off.

Management of Stormwater Under Agreed Order

In 1995, Amoco Oil Company Whiting Refinery voluntarily entered into an agreed order, Cause Number H-11187, with the IDEM. This order was for the mutual purpose of mitigating any threat to human health and the environment, to perform a Resource Conservation and Recovery Act (RCRA) Facility Investigation, and perform a Corrective Measures study to identify and evaluate alternatives for the corrective action necessary to prevent or mitigate any migration of releases of hazardous waste. This order includes a work plan for the J&L site. This work plan identified 27 pits that were generally cleaned up in 1977 and interim measures were put in place to prevent and abate off-site migration of contaminants. It is currently proposed to remove the requirements of this Agreed order for the J&L site and maintain stormwater compliance under the NPDES permit Industrial SWPPP for this area.

Future Stormwater Reroute to Outfalls 003 and 004

BP requests the option to re-route additional tank dike stormwater into Outfalls 003 and 004. Stormwater is to be moved from the following tank areas: (1) Indiana Tank Field; (2) South Tank Field; (3) South Tank Field Annex; (4) Stieglitz Park; and (5) Marine Dock. See Attachment 9B for tank field locations. At this time, BP does not envision having to add another outfall for stormwater; instead BP will build (or utilize existing) infrastructure and capacity to handle these sources subject to the current release operations at Outfall 003 and 004. BP does not anticipate significant changes in stormwater quality characteristics (i.e., concentration or release flows) with the additional tank field sources. Although the increased drainage areas from the additional tank fields can generate more stormwater runoff, this flow will still be subject to the release schedules in place for Outfall 003 and Outfall 004. Relevant stormwater information for the additional tank areas is given below.

Indiana Tank Field

The BP Whiting Indiana Tank Field (ITF) is located in Whiting, Lake County, Indiana immediately southwest of the main refinery area. The present day tank field has a contributing drainage area of 43.6 acres, which is bounded by Indianapolis Boulevard to the north and east, 129th Street to the south, and railroad tracks and residential housing to the west. The tank field sits over the Calumet aquifer, which is a regional aquifer in the area. A historical aerial dating from 1952 depicts 25 tanks in the area presently known as the ITF; therefore, the ITF was constructed prior to 1952. In 1952, the eastern section of present day ITF contained residential housing. In an aerial dated 1958, the residential area had been demolished. Currently, 30 tanks are present in the tank field with one tank, 3710, awaiting demolition.

Land Cover

The ITF consists of asphalt access roads, gravel tank dike areas, gravel or cement dikes, and tanks with minor pumping/piping systems. There is no vegetation within the drainage area. Land use estimates are 11% asphalt road, 15% tanks, and 74% gravel.

Stormwater Drainage and Outfall Descriptions

The drainage area is all contained within well defined tank dikes and does not run off site. The ITF is not currently connected to the J&L and Lake George Area and does not have the capability to discharge out to Outfalls 003 or 004. Stormwater currently collects within the diked areas and typically infiltrates or evaporates. When ponding water becomes problematic, it is pumped to other dikes within ITF or to the process sewer system for treatment at the Lakefront WWTP. Future infrastructure is anticipated to be installed that would allow stormwater collected in ITF to be discharged to Outfalls 003 and/or 004 in accordance with the discharge limitations set forth in NPDES permit number IN0000108.

Stormwater Control Features

The tank dike features of ITF were originally designed for spill prevention although they also contain stormwater on site. Each tank dike is a small collection basin which can hold stormwater until it needs to be removed from the tank dike. Future infrastructure will provide conveyance of stormwater from the tank dikes to Outfalls 003 and/or 004.

Industrial Activities

Historically, the inventory of materials stored in the tanks within the ITF has included naphtha, gas oils, furnace oils, ultraformates, pentane, Jet-A, diesel fuel, gasoline, distillates, and ethanol. Within the tank field, the tanks are surrounded by concrete dikes as secondary containment. A series of process lines run within the tank field, some of which are header lines to each tank. Three remediation systems are in place within the ITF, one of which is inactive. The systems consist of two wellpoint systems (active) and a recovery well (inactive). The wellpoint systems are located along and in the vicinity of the western boundary of the ITF property, and the inactive recovery well system is situated in the southern part of the property. BP Marketing Terminal C, which is primarily used for loading products, is on the north end of the ITF property.

Stormwater Run-on

Tank dikes definitively separate the ITF from adjacent properties and effectively eliminate any stormwater run-on.

Non-Stormwater Discharges

Non-stormwater discharges within the ITF to Outfalls 003 and 004 may include the following when future infrastructure is in place:

- Firewater system flushing;
- Potable water sources including waterline flushing;
- Uncontaminated ground water;
- Routine exterior building wash down which does not use detergents or other compounds;
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used; and
- Equipment Hydro-testing using fire water.

The ITF contains three groundwater remediation well point systems. As contaminants are pumped out of the ground, there is potential for some stormwater contamination from condensation or equipment rain wash-off.

Marine Dock

Four tanks at the Marine Docks are used to store asphalt, gas oil and decanted oil, and two tanks are used for ballast water storage. The tank field is bounded by the boat docks at the south, SafetyKleen to the west and north, and US Gypsum to the east and north. The north end of the Marine Dock consists of gravel laydown and parking areas. The southern end is the dock area for barge loading and in between is a small tank field.

Land Cover

The Marine Dock consists of asphalt and gravel access roads, gravel tank dike areas, gravel dikes, and tanks with minor pumping/piping systems. There is no vegetation within the drainage area. Land use estimates are 13% asphalt road, 15% tanks, and 72% gravel.

Stormwater Drainage and Outfall Descriptions

The drainage area is all contained within well defined tank dikes and does not run off site. The Marine Dock is not currently connected to the J&L and Lake George Area and does not have the capability to discharge to Outfalls 003 or 004. Stormwater currently collects within the diked areas and typically infiltrates or evaporates. When ponding water becomes problematic, it is pumped to other dikes within the Marine Dock or via vac truck to the process sewer system for treatment at the Lakefront WWTP. Future infrastructure is planned to transport stormwater collected in the Marine Docks to Outfalls 003 and/or 004 in accordance with the discharge limitations set forth in NPDES permit number IN0000108.

Stormwater Control Features

The tank dike features of Marine Dock were originally designed for spill prevention although they also contain stormwater on site. Each tank dike is a small collection basin which can hold stormwater until it needs to be removed from the tank dike. Future infrastructure will provide conveyance of stormwater from the tank dikes to Outfalls 003 and/or 004.

Industrial Activities

Four tanks store "black oil" product including asphalt, gas oil and decanted oil for shipment by barge or intermediates for return to the Refinery for further processing. There are also two pipelines that transfer gasoline and distillates to Norco in East Chicago and Schererville. Two ballast water tanks are used to store oily water from area sumps, dirty ballast water from vessels, and oily water from compartment clean outs. Additionally, a diesel fuel tank for the dock crane is located here. Activities center around the loading/unloading of barges for off-site shipment.

Stormwater Run-on

Tank dikes definitively separate the Marine Dock from adjacent properties and effectively eliminate any stormwater run-on.

Non-Stormwater Discharges

Non-stormwater discharges within the Marine Dock to Outfalls 003 and 004 may include the following when future infrastructure is in place:

- Firewater system flushing;
- Uncontaminated ground water;
- Routine exterior building wash down which does not use detergents or other compounds;
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used; and
- Equipment Hydrotesting using fire water.

The Marine Dock contains a groundwater remediation well point system and one recovery well. As contaminants are pumped out of the ground there is possibility for some stormwater contamination from condensation or equipment rain wash-off.

South Tank Field and Annex

The South Tank Field Complex has been an active part of the Whiting Refinery since its inception. The tank field was constructed over a former large shallow lake called Berry Lake in the 1800s. The lake was drained for the construction of the Standard Oil Co. of Indiana refinery which began operations in 1889. The tank field has thus been used solely for refinery process operations for its entire industrial history. The largest portion of the complex, containing 27 tanks, is designated the South Tank Field (STF) and is separated from the rest of the complex by Cline Avenue which runs generally east and west through the area. The South Tank Field Annex (STF Annex) is the tank field portion located south of Cline Avenue and contains 13 tanks and four butane storage spheres. All tank areas are contained by dike walls, or berms. The STF Complex is bordered to the north, west, and south by active BP Refinery property and state and municipal roads. To the north is 129th Street, to the west is Indianapolis Boulevard, and to the south is Riley Road. East of the STF Complex is the Indiana Harbor Belt rail yard, beyond which is US Steel Corporation Tin Operations. The approximate contributing drainage area of STF is 63.5 acres and STF Annex is 27.4 acres.

Land Cover

The STF consists of asphalt and gravel access roads, gravel tank dike areas, gravel dikes, and tanks with minor pumping/piping systems. There is no vegetation within the drainage area. Land use estimates are 11% asphalt road, 11% tanks, and 78% gravel. The STF Annex is comprised of the same land use classifications with an estimation of 13% asphalt road, 14% tanks, and 73% gravel.

Stormwater Drainage and Outfall Descriptions

The drainage area is all contained within well defined tank dikes and does not run off-site. Neither the STF nor STF Annex are currently connected to the J&L and Lake George Area and do not have the capability to discharge through Outfalls 003 or 004. Stormwater currently collects within the diked areas and typically infiltrates or evaporates. When ponding water becomes problematic, it is pumped to other dikes within the STF Complex or to the process sewer system for treatment at the Lakefront WWTP. Future infrastructure is anticipated to be installed that would allow stormwater collected in both STF and STF Annex to be discharged to Outfalls 003 and/or 004 in accordance with the discharge limitations set forth in NPDES permit number IN0000108.

Stormwater Control Features

The tank dike features of STF and STF Annex were originally designed for spill prevention although they also contain stormwater on site. Each tank dike is a small collection basin which can hold stormwater until it needs to be removed from the tank dike. Future infrastructure will provide conveyance of stormwater from the tank dikes to Outfalls 003 and/or 004.

Industrial Activities

Gasoline and distillate base components are stored and blended in STF for shipment or for return of intermediates to the Refinery for further processing. The BP Pipeline shipping manifold pumping station is located inside the northeast corner of STF. The STF Complex Control Room is located in STF adjacent to the shipping manifold pumping station. The STF also serves as the refinery distribution point for all butanes into and out of the refinery. A mined butane cavern with vessels and pump (above grade) is located beneath the western edge of the tank field. The cavern is used to supply butane to the gasoline blender and pipelines. The STF Annex is used to store, ship, and receive gasoline, distillate and base blending components. Its primary function is to supply product to pipelines, ships, rail, and truck carriers, but can also be used to store intermediates. The STF Annex also contains four butane storage spheres used to supply the Alkylation Unit and isomerate to the Gasoline Blender.

Stormwater Run-on

Tank dikes definitively separate STF and STF Annex from adjacent properties and effectively eliminate any stormwater run-on. Future infrastructure may involve routing stormwater from the Marine Dock through STF Annex which would then be routed through STF to Outfalls 003 and/or 004.

Non-Stormwater Discharges

Non-stormwater discharges within the STF Complex to Outfalls 003 and 004 may include the following when future infrastructure is in place:

- Firewater system flushing;
- Uncontaminated ground water;
- Routine exterior building wash down which does not use detergents or other compounds;
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used; and
- Equipment Hydrotesting using fire water.

STF contains three groundwater remediation well point systems and multiple recovery wells. STF Annex contains one groundwater remediation well point system and recovery wells. As contaminants are pumped out of the ground there is possibility for some stormwater contamination from condensation or equipment rain wash-off.

Stieglitz Park Tank Field

The Stieglitz Park Tank Field (Stieglitz Park) is located in Whiting, Lake County, Indiana. The contributing drainage of the tank field has an area of 50.7 acres and is bounded by the ECI property to the south, Indianapolis Blvd and the South Tank Field to the east, 129th Street and Indiana Tank Field to the north, and the J&L site and the Baltimore Ohio Railroad to the west. Historically, this area has been used as a tank field; however, before 1964, the eastern half of the Stieglitz Park Tank Field was a residential area. Sometime between 1954 and 1964 the houses were demolished and after 1964 the residential streets were removed. Currently, 16 tanks remain on the property, of which 12 are active.

Land Cover

Stieglitz Park consists of asphalt and gravel access roads, gravel tank dike areas, gravel dikes, and tanks with minor pumping/piping systems. There is no vegetation within the drainage area. Land use estimates are 7% asphalt road, 13% tanks, and 80% gravel.

Stormwater Drainage and Outfall Descriptions

The drainage area is all contained within well defined tank dikes and does not run off-site. Stieglitz Park is not currently connected to the J&L and Lake George Area and does not have the capability to discharge through Outfalls 003 or 004. Stormwater currently collects within the diked areas and typically infiltrates or evaporates. When ponding water becomes problematic, it is pumped to other dikes within Stieglitz Park or to the process sewer system for treatment at the Lakefront WWTP. Future infrastructure is anticipated to be installed that would allow stormwater collected within Stieglitz Park to be discharged to Outfalls 003 and/or 004 in accordance with the discharge limitations set forth in NPDES permit number IN0000108.

Stormwater Control Features

The tank dike features of Stieglitz Park were originally designed for spill prevention although they also contain stormwater on site. Each tank dike is a small collection basin which can hold stormwater until it needs to be removed from the tank dike. Future infrastructure will provide conveyance of stormwater from the tank dikes to Outfalls 003 and/or 004.

Industrial Activities

Generally, the inventory of the tanks within the Stieglitz Park Tank Field has historically been jet fuel, gasoline, benzene, NESHAP water and draw, hard paving base, FCU Feed/Asphalt, and diesel fuel. Currently, the tank field handles a variety of reduced crude products including asphalt, gas oil, and decanted oil. In addition, blending and final processing of jet fuel is done at Stieglitz Park. Within the tank field, the tanks are surrounded by gravel dikes that serve as secondary containment. Besides tanks, a series of process lines run within the tank field, some of which are header lines to each tank.

Stormwater Run-on

Tank dikes definitively separate Stieglitz Park from adjacent properties and effectively eliminate any stormwater run-on. Future infrastructure may involve routing stormwater from the Marine Dock through STF Annex and STF which would then be routed through Stieglitz Park to Outfalls 003 and/or 004.

Non-Stormwater Discharges

Non-stormwater discharges within Stieglitz Park to Outfalls 003 and 004 may include the following when future infrastructure is in place:

- Firewater system flushing;
- Uncontaminated ground water;
- Routine exterior building wash down which does not use detergents or other compounds;
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used; and
- Equipment Hydrotesting using fire water.

Stieglitz Park contains one groundwater remediation well point system. As contaminants are pumped out of the ground there is possibility for some stormwater contamination from condensation or equipment rain wash-off.

asphyxiation. Additionally, there is research to suggest that maintaining chlorine residual weakens the byssal threads formed following chlorination. Byssal threads are secreted by adults and are their means of attachment to a hard surface. This results in detachment in areas where water velocity was previously sufficient for settlement.

III. Program Monitoring

BP and its contractor monitor the kill program. The effectiveness of the kill is based on mortality rates of mussels in the system. Shell impact is observed at the automated strainers located at #3 SPS, Alky Tank 15 and 11C Pipestill. The contractor tests for TRC at the J100 pump (inlet), # 6 Separator inlet and # 6 Separator outlet twice per day to insure that a sufficient residual is maintained throughout the treatment. The contractor tests routinely for TRC at sample locations at 11 Pipestill, #3SPS, Alky, 12 Pipestill and VRU 300. Both total residual chlorine (TRC) and free available chlorine (FAC) readings are taken at the PCU. The satellite bleach feed at the PCU has been put into service for specific oxidant demands at this unit. Changes in bleach feed-rate are made based on J100 pump inlet, refinery and 6 Separator inlet TRC readings.

Total residual chlorine is tested twice daily at the inlet to 6 Separator. The DPD method is used at the compliance point to observe color change only and not used to obtain a concentration. These data are used to monitor outfall compliance. The # 6 separator ORP has a high and low alarm point. High alarm indicates loss of the dechlorination system while low alarm indicates an over feed of dechlorination chemical. This allows operators time to make adjustments and maintain compliance. During the kill program, the contractor provides coverage at 7 AM and 5 PM daily plus 24-hour callout service for problems or questions.

OTCW system is monitored very closely to avoid possible pluggage of strainers and heat exchangers with dead mussels. It is of critical importance that all units on the OTCW system clean their water strainers and backflush critical exchangers regularly. This is the only way to prevent equipment pluggage problems during a kill program.

IV. Lake Front Operator Duties

During the year-round kill program, BP operators help monitor the treatment by checking the ORP readings at # 6 separator outlet. These readings are necessary to ensure the TRC in 6 Separator effluent remains below the permit limit of 0.06 mg/l. Every four hours the inventories of the bleach and sulfite tanks are recorded. Operations comments regarding the treatment (low chemical levels, leaks, broken ORP units, etc.) are also recorded so the contractor can follow up.

Sp-Products North America Inc.: Whitefish Refinery
Wastewater & Water Treatment Additive Data

Updated 1/22/11

Demand-Trac 400	Demand-Trac 900 Baker Petrolite Building Exisiting Outfall	Zinc Chloride - 65% Volatile (commercial chemicals) Catalytic Oxid.	Phosphoric Acid - 70% Acidified	BPC-815160 Baker Petrolite Exisiting Catalytic Oxid.	BPC-817205 Baker Petrolite Exisiting Catalytic Oxid.	BPC-815170 Baker Petrolite Exisiting Catalytic Oxid.
Point of Infection						
Fried Ratite	Cooling Towers (#1 - #6) & SSES Unit 352,285 gpm/day	Cooling Towers (#1 - #6) & SSES Unit 60,231 gpm/day	Cooling Towers (#1 - #6) & SSES Unit 55,515 gpm/day	Cooling Towers (#1 - #6) & SSES Unit 144,037 gpm/day	Cooling Towers (#1 - #6) & SSES Unit 571,141 gpm/day (annual average)	Cooling Towers (#1 - #6) & SSES Unit 4,535 gpm/day
Water Treatment Concentration	5.0 - 7.0 mg/l (active residue)	6.5 mg/l	2.0 mg/l	2.0 mg/l	1.5 mg/l	1.5 mg/l
Duration of Use (day/day)	24 hr/day	24 hr/day	24 hr/day	24 hr/day	24 hr/day	24 hr/day
Duration of Use (days/year)	365 days/year	365 days/year	365 days/year	365 days/year	365 days/year	365 days/year
Final Discharge Concentration at Outfall	4.69 mg/l (waste case) 4.50 mg/l (waste case)	2.1 mg/l	2.1 mg/l	2.1 mg/l	2.1 mg/l	2.1 mg/l
Determination of Discharge Concentration	Removed with the solids in the DAF unit. Any remaining material will be consumed in the Advanced Sludge Tank. Expected that the Advanced Sludge tank should approach zero.	Reinforced with the solids in the DAF unit. Any remaining material with the consumed in the Advanced Sludge tank. Expected that the Advanced Sludge tank should approach zero.	Waste case based upon 100% of additive remaining in the tank discharge and no removal of sludge prior to the DAF separator. DAF, activated sludge plant and final filters.	Waste case based upon 100% of additive remaining in the tank discharge and no removal of sludge prior to the DAF separator. DAF, activated sludge plant and final filters.	Waste case based upon 100% of additive remaining in the tank discharge and no removal of sludge prior to the DAF separator. DAF, activated sludge plant and final filters.	Waste case based upon 100% of additive remaining in the tank discharge and no removal of sludge prior to the DAF separator. DAF, activated sludge plant and final filters.
Control Description	Each cooling tower is analyzed for dispersent residuals and additive ratio are adjusted accordingly.	Each cooling tower is analyzed for dispersent residuals and additive ratio are adjusted accordingly.	Each cooling tower has an online phosphate analyzer to control the pump rate to meet the water supply rate which drives addition rate changes. Samples are taken 3 part week and tested for the concentration of zinc.	Each cooling tower has an online phosphate analyzer to control the pump rate to meet the water supply rate which drives addition rate changes. Samples are taken 3 part week and tested for the concentration of zinc.	Additive is added based upon local conditions and microbiological monitoring results. It is used as needed and is added continually in small doses.	Additive is added based upon local conditions and microbiological monitoring results. It is used as needed and is added continually in small doses.
Hardness of Discharge Water	216 mg/l	216 mg/l	216 mg/l	216 mg/l	216 mg/l	216 mg/l
Chemical Composition	19% Triacid Citrate/Sodium Salt 5% TBC-T 2% Sulfonated Aromatic 1% Sulfonated Aromatic	18% Triacid Citrate/Sodium Salt 7.5% TBC-T 1% Sulfonated Aromatic	50% Zinc Chloride	75% Phosphoric Acid	50% Sodium Tetracycline	25% n-methylalkanoic ln. ketosane 45% Glycerol/Hydrate
Treatment System Blowdown Rate	2.1 mgd	2.1 mgd	2.1 mgd	2.1 mgd	2.1 mgd	2.1 mgd
Outfall No. Rate	19.9 mgd	19.9 mgd	19.9 mgd	19.9 mgd	19.9 mgd	19.9 mgd
Treatment System Temperature	70.0 deg F	70.0 deg F	70.0 deg F	70.0 deg F	70.0 deg F	70.0 deg F
Treatment System pH	7.0	7.0	7.0	7.0	7.0	7.0
Toxicity Data	Initial results are estimated based on data provided on similar components/compounds and from literature sources.	Initial results are estimated based on data provided on similar components/compounds and from literature sources.	Toxicity results for this additive provided below.	Toxicity results for this additive provided below.	Toxicity results for this additive provided below.	Toxicity results for this additive provided below.
Danio rerio 96 hr LC50	16.6 mg/l	16.6 mg/l	16.6 mg/l	16.6 mg/l	16.6 mg/l	16.6 mg/l
Goldfish Mortality 96 hr LC50						
Rainbow Trout 96 hr LC50						
Carassius Auratus 96 hr LC50	5.0 mg/l	5.0 mg/l	5.0 mg/l	5.0 mg/l	5.0 mg/l	5.0 mg/l
Carassius Auratus 20 hr LC50						
Daphnia Magna 24hr LC50						
Daphnia Magna 28hr LC50						
Rainbow Trout 96hr LC50						
Bluegill Sunfish 96hr LC50						
Acaris Lomia 48hr LC50						
Phenophorus Pionorellus 48hr LC50						
Phenophorus Pionorellus 86hr LC50						
Phenophorus Pionorellus 86hr LC50						
Mosquitofish 96hr LC50						
Zebra Fish 96hr LC50 (fertilized)						
Mallard Duck LD50						
Freshwater Invertebrates & Fish Acute EC50/LC50	50 - 100 mg/l					
Freshwater Algae Static Acute EC50						
Freshwater Biodegradability 21 Day OECD 311D	<20%					
Freshwater Biodegradability 5 Day/20mg/l						
Freshwater Biodegradability 5 Day/20mg/l	Effective pH range: 8.0 - 9.3	Effective pH range: 8.0 - 9.3	Effective pH range: 7.0 - 8.6	Effective pH range: 7.0 - 8.6	Effective pH range: 8.0 - 9.3	Effective pH range: 8.0 - 9.3
Relationship of toxicity to pH						
Relationship of toxicity to water hardness	Effective hardness 150 - 160 mg/l as CaCO ₃ . Calcium hardness has toxicity generally increases with decreasing hardness.	Effective hardness 150 - 160 mg/l as CaCO ₃ . Calcium hardness has toxicity generally increases with decreasing hardness.	Effective hardness 150 - 160 mg/l as CaCO ₃ . Calcium hardness has toxicity generally increases with decreasing hardness.	Effective hardness 150 - 160 mg/l as CaCO ₃ . Calcium hardness has toxicity generally increases with decreasing hardness.	Effective hardness 150 - 160 mg/l as CaCO ₃ . Calcium hardness has toxicity generally increases with decreasing hardness.	Effective hardness 150 - 160 mg/l as CaCO ₃ . Calcium hardness has toxicity generally increases with decreasing hardness.
N-Octanol/Water Partition Coefficient						

Additive Name	7145 PLUS Antifouling	Partic Solidite	Permit Sludge	50% Calcium	BPS-5715	Sulfuric Acid	100% Caustic
Supplier	ONC Naco	Korea	Korea	DOW	Stable Freeze™	Nausea	Old World Industries, Inc.
Existing or New	Existing	Existing	Existing	Existing	Existing	Exposure	Existing
Outfall	Outfall D05	Outfall D05	Outfall D05	Cofferdam D05	Cofferdam D05	Outfall D05	Outfall D05
Point of Injection	Activated Sludge Plant Clarifiers	Activated Sludge Plant	Boiler Feed Water	Cooling Tower #1, #2	Cooling Towers #1, #2	SBS, Unit Tower	SBS, Unit Tower
Feed Rate	465,864 grams/day	181,760 grams/day	20,961 grams/day	1,625,687 grams/day	30,000 grams/day (estimated)		
Water Treatment Concentration	50 mg/l	21 mg/l	6.0 mg/l	21.5 mg/l	30.0 mg/l	24 hr/day	24 hr/day
Duration of Use (days/yr)	24 hrs/day, as needed	24 hrs/day, as needed	24 hrs/day	365 days/year	365 days/year	365 days/year	365 days/year
Final Discharge Concentration at Outfall	50 mg/l	3.75 mg/l	0.75 mg/l (worst case)	0.75 mg/l	0.75 mg/l	0.75 mg/l	0.75 mg/l
Determination of Discharge Concentration	100% of the material is present in the system and consumed; therefore, 0 mg/l is expected in the final discharge.	This worst case is based upon 100% of additive remaining in final discharge when the additive is used.	This worst case is based upon 100% of additive remaining in final discharge when the additive is used.	Doseage is based on orthophosphate results measured.	100% of the material is present in the system and consumed; therefore, 0 mg/l is expected in the final discharge.	The additive is injected continuously into the WWTP effluent. All scaling reported have been attributed to the scaling tower.	The SBS unit cooling towers will have an online pH meter to control the pump rate to meet the set point pH 7.5. In the event of a pH meter failure, the pump is set based upon manual pump samples.
Control Description	This additive is fed as needed directly to the additive basin until foaming is reduced. Additive varies with current conditions and is added manually with current conditions and is inspection of foam in tank.	Additive use is only temporary to help with settling the clarifier bed to normal depths.	Additive use is to reduce H2S concentration in the city sludge.	Dosage is based on orthophosphate results measured. Pump rate is set to maintain between 0.3 - 0.5 orthophosphate.	Each cooling tower has an online pH meter to control the pump rate to meet the set point pH 7.5. In the event of a pH meter failure, the pump is set based upon manual pump samples.	Each cooling tower has an online pH meter to control the pump rate to meet the set point pH 7.5. In the event of a pH meter failure, the pump is set based upon manual pump samples.	Each cooling tower has an online pH meter to control the pump rate to meet the set point pH 7.5. In the event of a pH meter failure, the pump is set based upon manual pump samples.
Hardness of Discharge Water	218 mg/l	218 mg/l	218 mg/l	216 mg/l	216 mg/l	216 mg/l	216 mg/l
Chemical Composition	1-5% n-Decane 5-10% o-Cresol 0.1% Paraffin Wax 10-20% Hydrocracked light distillate 40-70% Straight run middle distillate	12.2% Ferric Iron (Fe+3) <0.01% Ferrous Iron (Fe+2) <0.1% Sulfuric Acid 55% 45% Ferric Sulfate	37% Phosphoric Acid 6% Sulfuric Acid 1% Nitric Acid	50% Sodium Hydroxide	Acrylic Polymer Sulfonate	70-100% Sulfuric Acid	
Treatment System Blowdown Rate	N/A	N/A	N/A	N/A	N/A	19.9 MGD	21.1 mgd
Treatment System Flow Rate	10.9 MGD	10.9 MGD	10.9 MGD	10.9 MGD	10.9 MGD	19.9 MGD	19.9 MGD
Treatment System Temperature	70.0 °F	70.0 °F	70.0 °F	70.0 °F	70.0 °F	70.0 °F	70.0 °F
Toxicity Data	7.0 LD ₅₀ 7.0 LD ₅₀ No test. No test.	7.0 LD ₅₀ 7.0 LD ₅₀ No test.	7.0 LD ₅₀ 7.0 LD ₅₀ No test.	7.0 LD ₅₀ 7.0 LD ₅₀ No test.	7.0 LD ₅₀ 7.0 LD ₅₀ No test.	7.0 LD ₅₀ 7.0 LD ₅₀ No test.	7.0 LD ₅₀ 7.0 LD ₅₀ No test.
Domoic acid LC50	449 mg/l						
Fenthion Minimum 85th/LC50							
Carbofenthion 24hr LC50							
Dimethyl Mercury 48hr LC50	120 mg/l						
Dimethyl Arsenic 24hr LC50							
Dimethyl Arsenite 24hr LC50							
Diphenyl Acetate 24hr LC50							
Diphenyl Acetone 96hr LC50							
Rainbow Trout 96hr LC50	310 mg/l						
Bivalgal Survival 96hr LC50							
Acaridae 48hr LC50							
Lepidoptera survival 48 hr. LC50							
Phenophthalein 96hr LC50							
Phenophthalein 96hr LC50							
Phenophthalein 96hr LC50							
Mosquito Fish 48hr LC50							
Threespine Stickleback 96hr LC50 (decreased)							
Zebra-Shell (Bivalve) 96hr LC50							
Freshwater Invertebrates & Fish Acute EC50/C50							
Freshwater & algae Static Acute EC50							
Freshwater Bioavailability 24 Days OECD							
Freshwater Biodegradability 21 Day 2,0mg/l							
Freshwater Biodegradability 21 Day 3,0mg/l							
Relationship of toxicity to pH	Toxicity does not change with pH.						
Relationship of toxicity to water hardness	Toxicity does not change with water hardness.						
N Octanol/Water Partition Coefficient	5.5						

IP Products North America Inc. - Whiting Cemetery
Watercolor & Water Treatment Additive Data

Updated 11/21/11	Sodium Hypochlorite - 12.5%	Bromine Bleach - 40%	BPP# 6048	Potassium Permanganate	Hypothioboric Acid - 31%	BPP# 7453
Additive Name	For Other Bleach Substitutes	Basis Bleach	Batch Periods	Melaleuca Root Extract	Vinegar (Formic Acid-Chamomile)	Batch Periods
Supplier	K. A. Schild	Extruding	Extruding	Extracting	Extruding	Extruding
Existing or New	Orifill 002	Orifill 002	Orifill 005	Orifill 005	Orifill 005	Orifill 005
Orifill						
Point of Infection						
Feed Rate	17.000000 mm/day	# Sprayer Element	200,000.000 g/min/day	Activated Sludge Plant Discharge	Chlorine Tablets #3 - #6	DAF Influent
Water Treatment Concentration	2.0 mg/l	Steam Condenser System	40.04 grams/day	16.250 gram/day	1,504.35 gram/day	167.750 gram/day
Duration of Use (days)	24 hours		7.0 mg/l	4.0 mg/l	75 mg/l	3 mg/l
Duration of Use (days/year)	365 days/year		24 hours	17 hours	1 hour	21 hours
Final Discharge Concentration at Outfall	0.000000 mg/l		365 days/year	50 days per year	30 days per year	365 days/year
Determination of Discharge Concentration	0.000000 mg/l		0.66 mg/l (Weight Loss)	0.00 mg/l	0.03 mg/l (Weight Loss)	0.03 mg/l
Detention time (hrs)	1.000000 hrs		0.000000 hrs	0.000000 mg/l	0.000000 mg/l	0.000000 mg/l
Flow rate (gallons/min)	1,000.000000		0.000000000	0.000000000	0.000000000	0.000000000
Flow rate (gallons/hour)	60,000.000000		0.000000000	0.000000000	0.000000000	0.000000000
Flow rate (gallons/day)	1,440,000.000000		0.000000000	0.000000000	0.000000000	0.000000000
Flow rate (gallons/year)	525,600.000000		0.000000000	0.000000000	0.000000000	0.000000000
Outfall Flow Rate	21.0 mg/l		21.0 mg/l	21.0 mg/l	21.0 mg/l	21.0 mg/l
Treatment System Blowdown Rate	N/A		N/A	N/A	N/A	N/A
Treatment System Temperature	86.2 °C/180 °F		86.2 °C/180 °F	19.9 °C/67 °F	19.9 °C/67 °F	19.9 °C/67 °F
Toxicity Data	10.000000 mg/l		50-110 mg/l F	50-450 mg/l F	50-100 mg/l F	50-100 mg/l F
Danio rerio 96 h LC50			7.0-8.0	6.0-9.0	7.0-8.0	7.0-8.0
Freshwater Minnow 96h/LC50			Toxicity results for this additive provided below.			
Cercopithicus aethiops/LC50						
Daphnia Magna 48h/LC50						
Daphnia Magna 24h/LC50						
Daphnia Magna 48h/LC50						
Daphnia Magna 48h/LC50						
Frogs/Rana Temporalis/LC50						
Gasterosteus aculeatus/LC50						
Gobius Organophosphorus/LC50						
Acetes tunas 96h/LC50						
Phenophthalein 96h/LC50						
Phenolphthalein 96h/LC50						
Threespine stickleback 96h/LC50						
Zebrafish (Brachydanio rerio) 96h/LC50						
Fennelmooth smelt 96h/LC50						
Colo salmon 96 h/LC50						
Chinook salmon 96h/LC50						
Chinook salmon 216h/LC50						
Bowfin quill/LC50						
Menidia Brama 24h/LC50						
Swordfish (Xiphias glutatus) 96h/LC50						
Mallotus Dusky L00						
Freshwater Invertebrates & Fish Acute EC50/LC50						
Freshwater Algae Static Acute EC50						
Freshwater Biodegradability 28 Day OECD-311D						
Freshwater Biodegradability 6 Day/20mg/l						
Freshwater Biocongruity, 5 Day/2 Atm/pJ						
Effective pH range: 7.0 - 8.0						
Effective pH range: 5.0 - 6.5						
Relationship of toxicity to pH						
Relationship of toxicity to water hardness						
Relationship of hardness to water hardness						
Relationship of hardness to water hardness						
N Octanol/Water Partition Coefficient						

BP Products North America Inc. - Whiting Refinery	
Location 112711	Wastewater Waste Treatment Additive Data
Additive Name	BPW 72630
Supplier	Other
Existing or New	New
Current	Outfall
Point of Selection	Outfall, Brine Treatment
Flow Rate	107,365 gpm/day
Water Treatment Concentration	1.0 mg/L
Duration of Use (hrs/day)	24 hours
Duration of Use (days/yr)	365 days/year
Final Wastewater Concentration at Outfall	0.0 mg/L
Determination of Discharge Concentration	Based on the manufacturer's ingredient list, an estimated recovered chemical in the effluent would remain in the water phase. 0.012 mg/L would remain in the Brine Treatment Effluent. This will be oxidized in the Activated Sludge Plant and/or separated in the Activated Sludge Plant (under construction) in the clarifier and/or filtered in the final filters. The organic component will be separated in the clarifier and/or treated in the final filters.
Control Description	Addition rate is based on API gravity of crude oil to the tanks.
Harmless of Discharge Water	2.0 mg/L
Chemical Composition	30% aluminum chloride hydrate 10% polyaluminum chloride 10% polyacrylamide 15% polystyrene tannic acid surfactant
Treatment System Blowdown Rate	N/A
Outfall Flow Rate	18.9 MGD
Treatment System Temperature	60-80 deg F
Toxicity Data	7.0-9.0 Toxicity results for this additive provided below.
Fish/kind 877, L, C50	Fathead Minnow 96hr, C50
Ceriodaphnia 48hr, C50	
Daphnia Magna 48hr, L, C50	
Daphnia Magna 24hr, EC50	
Daphnia Magna 24hr, C50	
Daphnia Magna 96hr, C50	
Rotifer, Brine 48hr, C50	
Barnacle, Smith 96hr, C50	
Lepidium sativum, 72 hr, C50	
Acetone ions, 48hr, C50	
Phosphates, potassium 96hr, L,C50	
Phosphates, potassium 96hr, C50	
Threespine stickleback 96hr, C50 (carried)	
Threespine stickleback 96hr, C50	
Flammulina sulcipes 96hr, C50	
Coho salmon 96hr, L,C50	
Chinook salmon 96hr, C50	
Chinook salmon 24hr, C50	
Brown trout 96hr, L,C50	
Mosquito, Feb 48hr, C50	
Spiraea aquatica 96hr, C50	
Marine Dab 1250	
Freshwater invertebrates & Fish, Arctic EG90A, C50	
Freshwater algae static Acute 20 Day OECD 307D	
Freshwater biodegradability 28 Day OECD 307D	
Freshwater biodegradability 5 Day/2,limp4	
Relationship of biodegradability to pH	Effective pH range: 1-14. Toxicity of sulfonic polymers increases at pH's > 7.0
Relationship of toxicity to pH	Effective pH range: 1-14. Toxicity of sulfonic polymers decreases at pH's < 7.0
Relationship of toxicity to water hardness	Effectiveness of sulfonic polymers decreases with increasing water hardness and increasing TOC.
N Octano/Water Partition Coefficient	<1 mg/L

Supplier Name	Aceto Specialties, Inc.	Product A0205 LA Product	Specicide A076	BPW70001	Prestol A0205 LA Product
Existing or New	Existing	Reused	Salt Portals	Brine Treatment	Ashland
Current	Outfall	Outfall	NEW/Future use	NEW/Future use	NEW/Future use
Point of Selection	Outfall	Outfall	Outfall CDS	Outfall CDS	Outfall CDS
Flow Rate	107,365 gpm/day	107,365 gpm/day	107,365 gpm/day	107,365 gpm/day	107,365 gpm/day
Water Treatment Concentration	2.0 mg/L	2.0 mg/L	2.0 mg/L	2.0 mg/L	2.0 mg/L
Duration of Use (hrs/day)	24 hours	24 hours	24 hours	24 hours	24 hours
Duration of Use (days/yr)	365 days/year	365 days/year	365 days/year	365 days/year	365 days/year
Final Wastewater Concentration at Outfall	0.0 mg/L	0.0 mg/L	0.0 mg/L	0.0 mg/L	0.0 mg/L
Determination of Discharge Concentration	Based on the manufacturer's ingredient list, an estimated recovered chemical in the effluent would remain in the water phase. 0.012 mg/L would remain in the Brine Treatment Effluent. This will be oxidized in the Activated Sludge Plant and/or separated in the Activated Sludge Plant (under construction) in the clarifier and/or filtered in the final filters. The organic component will be separated in the clarifier and/or treated in the final filters. The inorganic component will be separated in the classifier and/or treated in the final filters.	Addition rate is based on DAF performance which includes oil and grease as well as influent and effluent turbidity measured every 2 hours.	Addition rate is based on flow and performance for oil and grease	Addition rate is based on flow and performance for oil and grease	Addition rate is based on flow and performance which includes oil and grease as well as influent and effluent turbidity measured every 2 hours.
Control Description	Addition rate is based on DAF performance which includes oil and grease as well as influent and effluent turbidity measured every 2 hours.	Addition rate is based on DAF performance which includes oil and grease as well as influent and effluent turbidity measured every 2 hours.	Addition rate is based on flow and performance for oil and grease	Addition rate is based on flow and performance for oil and grease	Addition rate is based on flow and performance which includes oil and grease as well as influent and effluent turbidity measured every 2 hours.
Harmless of Discharge Water	2.0 mg/L	2.0 mg/L	2.0 mg/L	2.0 mg/L	2.0 mg/L
Chemical Composition	30% aluminum chloride hydrate 10% polyaluminum chloride 10% polyacrylamide 15% polystyrene tannic acid surfactant	30% aluminum chloride hydrate 10% polyaluminum chloride 10% polyacrylamide 15% polystyrene tannic acid surfactant	20-30% petroleum distillates byproduct asphaltene	20-30% petroleum distillates byproduct asphaltene	10-35% aluminum chloride hydrate 5-10% polyaluminum chloride >5% polyphenylene bis(ether ether
Treatment System Blowdown Rate	N/A	N/A	N/A	N/A	N/A
Treatment System Temperature	19.9 MGD	19.9 MGD	19.9 MGD	19.9 MGD	19.9 MGD
Toxicity Data	7.0-9.0 Toxicity results for this additive provided below.	7.0-9.0 Toxicity results for this additive provided below.	7.0-9.0 Toxicity results for this additive provided below.	7.0-9.0 Toxicity results for this additive provided below.	7.0-9.0 Toxicity results for this additive provided below.
Fish/kind 877, L, C50	Fathead Minnow 96hr, C50	Fathead Minnow 96hr, C50	Fathead Minnow 96hr, C50	Fathead Minnow 96hr, C50	Fathead Minnow 96hr, C50
Ceriodaphnia 48hr, C50					
Daphnia Magna 48hr, L, C50					
Daphnia Magna 24hr, EC50					
Daphnia Magna 24hr, C50					
Daphnia Magna 96hr, C50					
Rotifer, Brine 48hr, C50					
Barnacle, Smith 96hr, C50					
Lepidium sativum, 72 hr, C50					
Acetone ions, 48hr, C50					
Phosphates, potassium 96hr, L,C50					
Phosphates, potassium 96hr, C50					
Threespine stickleback 96hr, C50 (carried)					
Threespine stickleback 96hr, C50					
Flammulina sulcipes 96hr, C50					
Coho salmon 96hr, L,C50					
Chinook salmon 96hr, C50					
Chinook salmon 24hr, C50					
Brown trout 96hr, L,C50					
Mosquito, Feb 48hr, C50					
Spiraea aquatica 96hr, C50					
Marine Dab 1250					
Freshwater invertebrates & Fish, Arctic EG90A, C50					
Freshwater algae static Acute 20 Day OECD 307D					
Freshwater biodegradability 28 Day OECD 307D					
Freshwater biodegradability 5 Day/2,limp4					
Relationship of biodegradability to pH	Effective pH range: 1-14. Toxicity of sulfonic polymers increases at pH's > 7.0	Effective pH range: 1-14. Toxicity of sulfonic polymers decreases at pH's < 7.0	Effective pH range: 1-14. Toxicity of sulfonic polymers increases at pH's > 7.0	Effective pH range: 1-14. Toxicity of sulfonic polymers decreases at pH's < 7.0	Effective pH range: 1-14. Toxicity of sulfonic polymers increases at pH's > 7.0
Relationship of toxicity to pH	Effectiveness of sulfonic polymers decreases at pH's < 7.0	Effectiveness of sulfonic polymers decreases at pH's < 7.0	Effectiveness of sulfonic polymers decreases at pH's < 7.0	Effectiveness of sulfonic polymers decreases at pH's < 7.0	Effectiveness of sulfonic polymers decreases at pH's < 7.0
Relationship of toxicity to water hardness	Effectiveness of sulfonic polymers decreases with increasing water hardness and increasing TOC.	Effectiveness of sulfonic polymers decreases with increasing water hardness and increasing TOC.	Effectiveness of sulfonic polymers decreases with increasing water hardness and increasing TOC.	Effectiveness of sulfonic polymers decreases with increasing water hardness and increasing TOC.	Effectiveness of sulfonic polymers decreases with increasing water hardness and increasing TOC.
N Octano/Water Partition Coefficient	<1 mg/L	<1 mg/L	<1 mg/L	<1 mg/L	<1 mg/L

Op Product North America Inc - Whiting Refinery
Waterworks & Water Treatment Additive Data

Updated 1/21/11

Additive Name	Prestrel A 3440 LTR Floculant	BP055420	C2QUT1100	BPC 000005
Supplier	Ashland	Baker Petrolite	Baking Petrolite	
Existing or New	New/Future use	Existing	Existing	
Outfall	Outfall 005	Outfall 005	Outfall 005	Outfall 002
Point of Injection		SRWFLU steam condensate system	WWTF: Effluent Recycle to Cooling Towers	Possess
Feed Rate	DAF influent 167.75g/dry/day	35.01g/dry/day	101.24kg/dry/day	23.35kg/dry/day
Water Treatment Concentration	2.3 mg/l	12 mg/l	0.30 mg/l	3 - 4 mg/l
Duration of Use [Hour/day]	24 hour/day	24 hour/day (when using recycling line)	24 hour/day	24 hour/day
Duration of Use [days/year]	365 days/year	365 days/year	365 days/year	365 days/year
Final Discharge Concentration at Outfall	0.12 mg/l (from case)	0.12 mg/l (from case)	0.0 mg/l	>0 mg/l (worst case)
Determination of Discharge Concentration	Based on estimated recovered chemical in water plus a 0.015 mg/l round robin in the influent effluent. This will be reduced in the Activated Sludge Particulate section of the clarifier and filtered in site final effluent.	Based on estimated recovered chemical in water plus a 0.015 mg/l round robin in the influent effluent. This will be reduced in the Activated Sludge Particulate section of the clarifier and filtered in site final effluent.	100% of the material is treated in the system and removed therefrom. Assume no removal at the secondary sludge plant.	Material would most likely be contained in the first discharge.
Control Description	Addition rate is based on DAF Performance which includes oil and grease as well as influent and effluent turbidity measured every 2 hours.	Rates will be determined from condensate sample of PH and TSM results.	Flow rate is based on flow and retention period which is measured, mass of the filtered calcium carbonate and downstream of process heat exchangers and after the heat transfer efficiency.	Additive is used based upon 3 mass of the filtered calcium carbonate and downstream of process heat exchangers and after the heat transfer efficiency.
Hardness of Discharge Water	218 mg/l	216 mg/l	216 mg/l	216 mg/l
Chemical Composition	20-30% aliphatic hydrocarbon 5% ethoxylated phenolphenol	Alkyl Ethox Alcohols 30-45%	30-40% Sodium Bromide 50% Polyacrylic Acid (PAA)	
Treatment System, Biovolume Rate	N/A	115 mrd.	N/A	1.44 mrd.
Outfall Flow Rate	19.8MGD	19.8 MGD	19.8 MGD	19.8 MGD
Treatment System, Temperature	60-70 deg F	60-70 deg F	60-70 deg F	60-70 deg F
Treatment System, pH	7.5-8.0	7.6-8.0	7.3	7.3-8.0
Toxicity Data	No data available for toxicity results for this organism.			Toxicity results are estimated based on available data and information on chemical components and from literature sources.
<i>Danio rerio 96 h/L C50</i>				
<i>Gambusia affinis 96 h/L C50</i>				
<i>Fundulus Major 24h/L C50</i>				
<i>Carassius auratus 48h/L C50</i>				
<i>Octodon Magua 96h/L C50</i>			1.0 DGIC mg/l	
<i>Octodon Magua 96h/L C50</i>			>1000 mg/l	
<i>Octodon Magua 96h/L C50</i>				
<i>Octodon Magua 96h/L C50</i>				
<i>Rainbow Trout 96h/L C50</i>		197 mg/l	>1000 mg/l	
<i>Bluegill Sunfish 96h/L C50</i>				
<i>Lepomis macrochirus 48 h/L C50</i>				
<i>Acaria lanza 48h/L C50</i>				
<i>Phorelabes prorates 48h/L C50</i>				
<i>Phorelabes prorates 96h/L C50</i>				
<i>Threespine stickleback 96h/L C50</i>				
<i>Zebrafish Embryo 96h/L C50 (fertilized)</i>				
<i>Mallard Duck L50</i>				
<i>Phenimmina aculeata 96h/L C50</i>				
<i>Freshwater Invertebrates & Fish Acute EC50/L C50</i>				
<i>Freshwater Acute Static Acute EC50</i>				
<i>Chinook salmon 96h/L C50</i>				
<i>Chinook salmon 21 Day OECD 301D</i>				
<i>Freshwater Biodegradability 5 Day/2 mg/l</i>				
<i>Freshwater Biodegradability 6 Day/3 mg/l</i>				
Relationship of toxicity to pH				Effective pH range: 5.0 - 3.3
Relationship of toxicity to water hardness				Effective hardness ranges: 150 - 600 mg/l Total Hardness, 100 - 300 mg/l Calcium Hardness, 50 - 150 mg/l Magnesium Hardness with decreasing hardness.
N Octanol-Water Partition Coefficient				